

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. - 34. (Cancelled).

35. (Previously Presented) A method of treating a medical disorder, comprising:

monitoring at least one sensor that senses physiological activity in one or more organs or organ systems;

performing a wavelet cross-correlation analysis on data obtained from said monitoring to determine whether an abnormal state caused by the medical disorder exists; and

if the abnormal state exists, administering one or more treatments selected from the group consisting of electrical stimulation, heating, cooling, and medicament to the one or more affected organs.

36. (Previously Presented) The method of claim 35, wherein the physiological activity comprises electrical activity.

37. (Previously Presented) The method of claim 35, wherein the physiological activity comprises chemical activity.

38. (Previously Presented) The method of claim 35, wherein the physiological activity comprises a combination of electrical and chemical activity.

39. (Previously Presented) The method of claim 35, wherein the physiological activity comprises thermal activity.

40. (Previously Presented) The method of claim 37, wherein the medical disorder is epilepsy and the organ is the brain.

41. (Previously Presented) The method of claim 40, wherein the one or more treatments comprise pulses of electrical stimulation.

42. (Previously Presented) The method of one of claims 35, 36, 37, or 38, wherein the electrical stimulation is administered so as to maintain charge balance.

43. (Previously Presented) The method of claim 35, wherein the medicament is a member selected from the group consisting of drugs, electrolytes, and fluids.

44. (Previously Presented) The method of claim 43, wherein the drugs are selected from the group consisting of nucleic acids, hormones, hydantoins, deoxybarbiturates, benzodiazepines, glutamate receptor agonists, glutamate receptor antagonists,  $\gamma$ -aminobutyric acid receptor agonists,  $\gamma$ -aminobutyric acid receptor antagonists, dopamine receptor agonists, dopamine receptor antagonists, drugs affecting NMDA receptors, drugs affecting AMPA receptors, drugs affecting metabotropic receptors, and anesthetics.

45. (Previously Presented) The method of claim 35, wherein the one or more treatments comprise electrical stimulation in combination with cooling.

46. (Previously Presented) The method of claim 35, wherein the medical disorder is a member selected from the group consisting of seizures, headaches, pain, trauma, hemorrhage, encephalitis, localized myelitis, mass lesions, psychiatric disorders, swelling, and inflammation.

47. (Withdrawn) The method of claim 35, wherein the medical disorder is a spinal disorder.

48. (Withdrawn) The method of claim 35, wherein the medical disorder is a peripheral nerve disorder.

49. (Previously Presented) The method of claim 35, wherein the medical disorder is a central nervous system disorder.

50. (Withdrawn) The method of claim 35, wherein the medical disorder is a member selected from the group consisting of cervical spondylosis, lumbar stenosis, multiple sclerosis, and spinal myoclonus.

51. (Withdrawn) A method of treating epilepsy, comprising:  
monitoring at least one sensor that detects electrical activity in the brain;  
performing a wavelet cross-correlation analysis on data obtained from said monitoring to determine whether an epileptic seizure is likely to occur or to determine whether one or more treatments selected from the group consisting of electrical stimulation, heating, cooling, and medicament is likely to prevent or abort epileptic seizure activity; and  
if the wavelet cross-correlation analysis indicates that one or more of said treatments is likely to prevent or abort epileptic seizure activity, administering the treatments.

52. (Withdrawn) The method of claim 51, wherein the one or more treatments comprise pulses of electrical stimulation.

53. (Withdrawn) The method of claim 52, wherein the pulses of electrical stimulation are administered so as to maintain charge balance.

54. (Withdrawn) The method of claim 51, wherein the medicament is a member selected from the group consisting of drugs, electrolytes, and fluids.

55. (Withdrawn) The method of claim 54, wherein the drugs are selected from the group consisting of nucleic acids, hormones, hydantoins, deoxybarbiturates, benzodiazepines, glutamate receptor agonists, glutamate receptor antagonists,  $\gamma$ -aminobutyric acid receptor agonists,  $\gamma$ -aminobutyric acid receptor antagonists, dopamine receptor agonists, dopamine receptor antagonists, drugs affecting NMDA receptors, drugs affecting AMPA receptors, drugs affecting metabotropic receptors, and anesthetics.

56. (Withdrawn) The method of claim 51, wherein the one or more treatments comprise electrical stimulation in combination with cooling.

57. (Withdrawn) A method of analyzing brain activity, comprising:  
monitoring at least one sensor that detects electrical activity in the brain;  
performing a wavelet cross-correlation analysis on data obtained from said  
monitoring; and  
based on the wavelet cross-correlation analysis, predicting when abnormal electrical  
activity will occur.

58. (Withdrawn) The method of claim 57, wherein the abnormal electrical  
activity represents epileptic seizure activity.

59. (Withdrawn) The method of claim 57, further comprising, based on the  
wavelet cross-correlation analysis, determining where the abnormal electrical activity  
originates in the brain.

60. (Withdrawn) The method of claim 57, further comprising, based on the  
wavelet cross-correlation analysis, determining the direction of propagation of the abnormal  
electrical activity.

61. (Previously Presented) The method of claim 35, wherein wavelet cross-  
correlation analysis comprises:  
performing a wavelet transform on data obtained from said monitoring to generate  
wavelet-transformed data; and  
performing a cross-correlation analysis on said wavelet-transformed data.

62. (Withdrawn) A method of treating a medical disorder, comprising:  
monitoring at least one sensor that senses physiological activity in one or more organs  
or organ systems;  
performing a wavelet cross-correlation analysis on data obtained from said monitoring  
to determine whether an abnormal state caused by the medical disorder exists, said wavelet  
cross-correlation analysis comprising:  
performing a wavelet transform on data obtained from said monitoring to  
generate wavelet-transformed data, and  
performing a cross-correlation analysis on said wavelet-transformed data; and

if the abnormal state exists, administering one or more treatments selected from the group consisting of electrical stimulation, heating, cooling, and medicament to the one or more affected organs.

63. (New) The method of claim 35, wherein said wavelet cross-correlation analysis is performed using a Gaussian wavelet.